Prepared for:
Air Resources Division
Research & Monitoring Branch
303-969-2820

February 2006
Monthly Report

Final Data

Gaseous Pollutants & Meteorology
NPS Gaseous Pollutant Monitoring Program

Air Resource Specialists, Inc.

Environmental Consultants

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Monthly Data Summary
February 2006

National Park Service
Gaseous Pollutant Monitoring Program

ATTACHED DATA PRODUCTS

The data collected by the NPS Gaseous Pollutant Monitoring Program (GPMP) during the month of February 2006 have been fully validated and are considered final. The attached PDF file provides a brief summary of the data collected during the month. This summary contains the following data products:

1. Monthly Summary of Ozone Data by Site
2. Monthly Summary of Sulfur Dioxide Data by Site
3. Monthly Summary of Selected Meteorological Data by Site
4. Monthly Data Collection Statistics

Viewing the PDF file requires Adobe Acrobat Reader. If you do not have this software, you can obtain a free download at the following Web link: http://www.adobe.com/products/acrobat/readstep2.html

WEB ACCESS OF DATA PRODUCTS

If opening email attachments is prohibited on your network, you can find a copy of this and previous months' summaries on the GPMP Project Web Site at: http://ard-aq-request.air-resource.com/project. You will be prompted for a user name (type your name) and a password, which is 'npsair'. You may also visit this web site for more information about the GPMP.

WEB ACCESS OF HOURLY DATA AND DATA PLOTS

From the GPMP Data Request Web Site (http://ard-aq-request.air-resource.com) you may directly access hourly average data files or stacked data plots. Click on "Get Data Files" or "Get Plots" and follow the directions on the page.

CONTACT INFORMATION

If you have any specific questions or comments about this month's data, or would like additional information, please contact the GPMP contractor at:

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Information Management Center
Phone: 800-344-5423
Air-Imc@air-resource.com

Or contact the National Park Service Air Resources Division (NPS ARD):

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Summary of Ozone Data by Site
02/01/2006 - 02/28/2006
National Park Service Gaseous Pollutant Monitoring Program

National Park Unit	Site Name	4 Highest Daily Maximum 8-Hour Average Concentrations[1] (ppb)					Highest Daily Maximum 1-Hour Average Concentrations [2] (ppb)	
		1st Highest	2nd Highest	3rd Highest	4th Highest	# Days with 8-Hour Average O3 Values >=85 ppb[3]	1st Highest	# Days with 1-Hour Average O3 Values >=125 ppb
Badlands	Visitor Center	50	46	45	45	0	51	0
Big Bend	K-Bar Ranch Road	55	51	50	49	0	56	0
Canyonlands	Island in the Sky	53	52	52	51	0	56	0
Chiricahua	Entrance Station	55	53	53	52	0	57	0
Craters of the Moon	Visitor Center	32	31	30	30	0	33	0
Death Valley	Park Village	53	51	51	50	0	56	0
Denali	Headquarters	48	47	47	47	0	50	0
Glacier	West Glacier Horse Stables	41	40	38	38	0	43	0
Grand Canyon	The Abyss	58	56	55	55	0	61	0
Great Basin	Maintenance Yard	56	52	49	48	0	58	0
Great Smoky Mountains	Cove Mountain	57	52	51	50	0	60	0
Great Smoky Mountains	Look Rock	62	57	51	49	0	67	0
Joshua Tree	Black Rock	68	65	64	56	0	70	0
Joshua Tree	Cottonwood Canyon	66	62	57	54	0	68	0
Lassen Volcanic	Manzanita Lake Fire Station	53	52	51	49	0	56	0
Mammoth Cave	Houchin Meadow	57	53	46	45	0	64	0
Mesa Verde	Resource Management Area	56	55	54	54	0	59	0
Mount Rainier	Tahoma Woods	49	46	46	42	0	51	0
North Cascades	Marblemount Ranger Station	45	45	44	42	0	46	0
Petrified Forest	South Entrance	56	52	52	52	0	58	0
Pinnacles	SW of East Entrance Station	55	55	52	49	0	58	0
Rocky Mountain	Long's Peak	60	60	59	58	0	67	0
Sequoia and Kings Canyon	Ash Mountain	58	52	51	49	0	61	0
Sequoia and Kings Canyon	Lower Kaweah	49	48	48	48	0	55	0
Shenandoah	Big Meadows	60	59	51	50	0	64	0
Voyageurs	Sullivan Bay	43	43	42	42	0	47	0
Yellowstone	Water Tank	56	56	55	54	0	59	0
Yosemite	Turtleback Dome	58	55	54	53	0	62	0

Summary of Ozone Data by Site
02/01/2006 - 02/28/2006
National Park Service Gaseous Pollutant Monitoring Program

National Park Unit	Site Name	4 Highest Daily Maximum 8-Hour Average Concentrations[1] (ppb)					Highest Daily Maximum 1-Hour Average Concentrations [2] (ppb)	
		1st Highest	2nd Highest	3rd Highest	4th Highest	# Days with 8-Hour Average O3 Values >=85 ppb[3]	1st Highest	# Days with 1-Hour Average O3 Values >=125 ppb
Zion	Dalton's Wash	53	51	51	51	0	57	0

1. The primary and secondary National Ambient Air Quality Standard for ozone is 0.08 ppm over an 8-hour period. (Attainment of the primary standard is reached if the annual fourth highest daily maximum 8-hour ozone concentration, averaged over three years, does not exceed 0.08 ppm, 84 ppb, or 157 µg/m³.) (40 CFR 50.10 with reference to Appendix D and I.)

2. The primary and secondary National Ambient Air Quality Standard for ozone is 0.12 ppm over a 1-hour period not to be exceeded more than once per year. (A value greater than 0.12 ppm, 124 ppb, or 235 µg/m³.) (40 CFR 50.9 with reference to Appendix D and H.)

3. An exceedance of the National Ambient Air Quality Standard for ozone occurs when an 8-hour average ozone conentration exceeds 0.08 ppm, 84 ppb, or 157µg/m³. (40 CFR 50.10 with reference to Appendix D and I.)

Summary of Sulfur Dioxide Data by Site
02/01/2006 - 02/28/2006
National Park Service Gaseous Pollutant Monitoring Program

National Park Unit	Site Name	Highest Hourly Average Concentration (ppb)	Highest Daily Maximum 3-Hour Average Concentrations[1] (ppb)		Highest Daily Maximum 24-Hour Average Concentrations [2] (ppb)	
			1st Highest	# Days with 3-Hour Average SO2 Values >=550 ppb	1st Highest	# Days with 24-Hour Average SO2 Values >=145 ppb
Hawaii Volcanoes	Observatory - Additional	852	610.7	1	239.1	2
Hawaii Volcanoes	Visitor Center - Additional	893	509.3	0	188.8	1
Shenandoah	Big Meadows	Insufficient Data				

1. The secondary National Ambient Air Quality Standard for sulfur dioxide is 0.5 ppm over a 3-hour period not to be exceeded more than once per year. (A value greater than 0.5 ppm, 549 ppb, or 1300 µg/m³ exceeds the standard.) (40 CFR 50.5.)

2. The primary National Ambient Air Quality Standard for sulfur dioxide is 0.14 ppm over a 24-hour period not to be exceeded more than once per year. (A value greater than 0.14 ppm, 144 ppb, or 365 µg/m³ exceeds the standard.) (40 CFR 50.4.)

Summary of Selected Meteorological Data by Site
02/01/2006 - 02/28/2006
National Park Service Gaseous Pollutant Monitoring Program

National Park Unit	Site Name	Wind Speed (Scalar) (m/s)	Ambient Temperature (degrees C)			Relative Humidity (%)			Precipitation (mm)
		Average	Average	Maximum	Minimum	Average	Maximum	Minimum	Accumulated during period
Badlands	Visitor Center	3.9	-2.5	22.3	-27.0	63	96	19	1.8
Big Bend	K-Bar Ranch Road	3.8	14.0	28.0	-3.5	30	85	4	0.0
Canyonlands	Island in the Sky	2.7	2.4	14.9	-8.9	37	97	12	0.9
Chiricahua	Entrance Station	3.4	10.2	22.4	-2.2	30	94	5	6.7
Craters of the Moon	Visitor Center	3.0	-7.7	4.7	-21.2	68	96	30	—
Death Valley	Park Village	3.4	17.8	28.3	7.5	17	71	6	1.3
Denali	Headquarters	1.7	-8.7	7.0	-31.1	65	95	28	8.3
Everglades	Beard Center	2.4	18.2	28.1	4.4	78	100	31	78.2
Glacier	West Glacier Horse Stables	0.8	-5.8	5.0	-29.7	80	99	26	20.5
Grand Canyon	The Abyss	2.7	3.9	14.0	-6.8	31	96	6	3.6
Great Basin	Maintenance Yard	2.6	-1.0	12.6	-14.2	52	95	12	24.2
Great Smoky Mountains	Cades Cove	1.6	2.9	18.6	-8.9	75	100	21	78.6
Great Smoky Mountains	Cove Mountain	5.4	-0.2	12.2	-11.6	69	100	14	56.7
Great Smoky Mountains	Look Rock	2.7	2.3	16.6	-10.1	68	100	21	57.5
Hawaii Volcanoes	Observatory	4.0	14.0	23.1	7.6	85	100	23	71.0
Hawaii Volcanoes	Visitor Center	3.1	13.2	20.6	7.4	91	99	37	109.3
Joshua Tree	Black Rock	3.4	9.5	19.4	-2.3	30	94	6	29.3
Joshua Tree	Cottonwood Canyon	4.6	12.5	21.2	1.5	25	93	8	1.0
Lassen Volcanic	Manzanita Lake Fire Station	1.9	0.8	15.3	-14.3	60	96	9	158.7
Mammoth Cave	Houchin Meadow	2.3	3.3	19.4	-13.1	66	99	19	59.8
Mesa Verde	Resource Management Area	3.3	2.0	13.6	-10.9	33	85	8	1.9
Mount Rainier	Tahoma Woods	1.4	2.2	13.5	-10.4	79	99	12	127.0
North Cascades	Marblemount Ranger Station	1.6	3.0	12.9	-5.1	70	94	8	212.9
Petrified Forest	South Entrance	4.1	5.2	19.7	-7.7	27	79	7	0.0
Pinnacles	SW of East Entrance Station	2.1	8.7	26.2	-5.4	68	96	11	45.2
Rocky Mountain	Long's Peak	3.9	-5.1	10.5	-25.1	49	96	13	11.2
Sequoia and Kings Canyon	Ash Mountain	2.4	10.5	22.2	1.1	55	100	13	48.5
Sequoia and Kings Canyon	Lower Kaweah	1.9	3.9	14.9	-10.1	57	100	6	29.5

Summary of Selected Meteorological Data by Site
02/01/2006 - 02/28/2006
National Park Service Gaseous Pollutant Monitoring Program

National Park Unit	Site Name	Wind Speed (Scalar) (m/s)	Ambient Temperature (degrees C)			Relative Humidity (%)			Precipitation (mm)
		Average	Average	Maximum	Minimum	Average	Maximum	Minimum	Accumulated during period
Shenandoah	Big Meadows	3.2	-2.6	11.6	-19.5	62	100	24	63.5
Theodore Roosevelt	Painted Canyon Visitor Center	5.3	-5.8	12.7	-30.1	71	95	35	0.6
Voyageurs	Sullivan Bay	2.5	-12.9	-2.7	-30.1	69	96	32	6.2
Wind Cave	Visitor Center	2.9	-2.3	17.9	-26.7	51	90	12	4.0
Yellowstone	Old Faithful	2.3	-9.4	5.5	-34.3	74	99	28	—
Yellowstone	Water Tank	1.7	-10.5	3.8	-29.4	72	96	23	16.0
Yosemite	Turtleback Dome	4.5	5.1	16.0	-7.7	49	99	6	113.1
Zion	Dalton's Wash	3.0	7.2	19.9	-4.2	32	94	7	10.3

Data Collections Statistics by Site
02/01/2006 - 02/28/2006
National Park Service Gaseous Pollutant Monitoring Program

National Park Unit	Site Name	Parameter Code											
		O3 % valid[1]	SO2 % valid[1]	SO2Add % valid[1]	VWD % valid[1]	SWS % valid[1]	TMP % valid[1]	RH % valid[1]	RNF % valid[1]	WET % valid[1]	DTP % valid[1]	SOL % valid[1]	FLOW % valid[1]
Badlands	Visitor Center	92.9	—	—	98.1	98.4	98.4	98.4	97.8	—	—	98.2	—
Big Bend	K-Bar Ranch Road	95.2	—	—	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Canyonlands	Island in the Sky	95.1	—	—	99.9	99.9	99.9	100.0	99.3	99.3	99.9	99.9	100.0
Chiricahua	Entrance Station	94.9	—	—	100.0	100.0	100.0	100.0	99.4	99.4	99.7	100.0	100.0
Craters of the Moon	Visitor Center	96.0	—	—	99.6	99.6	99.9	100.0	—	—	—	100.0	—
Death Valley	Park Village	81.4	—	—	99.9	99.9	99.9	100.0	99.3	99.3	99.9	99.9	100.0
Denali	Headquarters	95.8	—	—	100.0	100.0	100.0	100.0	99.3	100.0	100.0	100.0	100.0
Everglades	Beard Center	—	—	—	98.8	98.8	98.8	98.8	97.9	98.5	98.8	100.0	99.6
Glacier	West Glacier Horse Stables	89.9	—	—	97.9	97.9	100.0	100.0	99.4	100.0	100.0	99.0	100.0
Grand Canyon	The Abyss	95.5	—	—	100.0	100.0	100.0	100.0	99.4	99.6	100.0	100.0	100.0
Great Basin	Maintenance Yard	95.4	—	—	95.4	95.4	98.5	99.7	99.4	96.6	98.5	98.5	100.0
Great Smoky Mountains	Cades Cove	—	—	—	98.8	98.8	100.0	100.0	99.7	—	—	100.0	—
Great Smoky Mountains	Cove Mountain	99.1	—	—	99.1	99.1	100.0	100.0	100.0	—	—	100.0	—
Great Smoky Mountains	Look Rock	98.7	—	—	99.7	99.7	99.7	99.7	99.0	98.7	99.7	99.7	99.7
Hawaii Volcanoes	Observatory	—	60.7	60.7	100.0	100.0	98.4	98.4	99.9	—	—	—	—
Hawaii Volcanoes	Visitor Center	—	95.2	95.2	99.7	99.7	99.7	99.7	99.3	—	—	99.7	—
Joshua Tree	Black Rock	94.2	—	—	100.0	100.0	100.0	100.0	99.4	99.4	100.0	100.0	100.0
Joshua Tree	Cottonwood Canyon	93.2	—	—	93.2	93.2	93.2	93.2	93.2	—	—	93.2	—
Lassen Volcanic	Manzanita Lake Fire Station	91.8	—	—	92.7	92.7	97.2	97.3	96.3	97.0	97.2	97.3	97.9
Mammoth Cave	Houchin Meadow	95.5	—	—	100.0	100.0	100.0	100.0	99.4	99.3	100.0	100.0	100.0
Mesa Verde	Resource Management Area	94.9	—	—	99.0	99.0	99.0	99.4	98.7	98.7	99.0	99.0	99.6
Mount Rainier	Tahoma Woods	83.5	—	—	89.3	89.3	98.5	98.5	98.4	98.1	98.5	98.4	98.7
North Cascades	Marblemount Ranger Station	93.9	—	—	98.8	98.8	98.8	98.8	98.2	98.4	98.8	98.8	99.0
Petrified Forest	South Entrance	94.9	—	—	99.6	99.6	99.6	99.6	99.6	99.6	99.6	99.6	99.4
Pinnacles	SW of East Entrance Station	94.5	—	—	99.6	99.6	99.7	100.0	99.4	66.4	99.7	100.0	67.1
Rocky Mountain	Long's Peak	95.4	—	—	100.0	100.0	100.0	100.0	99.3	99.6	100.0	100.0	100.0
Sequoia and Kings Canyon	Ash Mountain	81.1	—	—	99.9	99.9	99.9	99.9	99.4	99.4	99.9	99.9	100.0
Sequoia and Kings Canyon	Lower Kaweah	95.4	—	—	99.9	99.9	99.9	99.9	99.3	—	—	99.9	—
Shenandoah	Big Meadows	90.6	0.0	—	99.4	99.4	99.4	99.4	98.8	99.3	99.4	99.4	99.6
Theodore Roosevelt	Painted Canyon Visitor Center	—	—	—	100.0	100.0	100.0	100.0	99.3	99.4	100.0	100.0	73.1
Voyageurs	Sullivan Bay	90.8	—	—	99.6	99.6	99.6	99.6	99.6	99.6	99.6	99.6	99.7
Wind Cave	Visitor Center	—	—	—	100.0	100.0	100.0	100.0	99.6	99.6	100.0	100.0	100.0
Yellowstone	Old Faithful	—	—	—	100.0	100.0	100.0	100.0	—	—	—	—	—

Data Collections Statistics by Site
02/01/2006 - 02/28/2006
National Park Service Gaseous Pollutant Monitoring Program

National Park Unit	Site Name	Parameter Code											
		O3 % valid[1]	SO2 % valid[1]	SO2Add % valid[1]	VWD % valid[1]	SWS % valid[1]	TMP % valid[1]	RH % valid[1]	RNF % valid[1]	WET % valid[1]	DTP % valid[1]	SOL % valid[1]	FLOW % valid[1]
Yellowstone	Water Tank	94.6	—	—	99.9	99.9	100.0	100.0	99.6	100.0	100.0	100.0	100.0
Yosemite	Turtleback Dome	93.5	—	—	98.7	98.7	98.7	98.7	98.1	98.1	98.7	98.7	97.9
Zion	Dalton's Wash	93.6	—	—	98.4	98.4	98.4	98.4	97.9	—	—	98.4	—
Average Network Data Collection		93.1	52.0	78.0	98.7	98.8	99.3	99.4	98.9	97.8	99.5	99.3	97.4

Key:

O3 = Ozone Analyzer
SO2 = Sulfur Dioxide Analyzer
SO2Add = Sulfur Dioxide Analyzer
VWD = Vector Wind Direction
SWS = Scalar Wind Speed
TMP = Ambient Temperature
RH = Relative Humidity
RNF = Precipitation
WET = Wetness Sensor
DTP = Delta Temperature
SOL = Solar Radition
FLOW = Filter Pack Flow Rate

Performance Goals:

Monthly Criteria:
100% of sites, >= 60% valid data capture
90% of sites, >= 75% valid data capture
80% of sites, >= 85% valid data capture

Quarterly Criteria:
100% of sites, >= 85% valid data capture
90% of sites, >= 90% valid data capture
80% of sites, >= 95% valid data capture

1. Percent valid can be less than 100% due to calibrations, routine maintenance, power failures, audits or other circumstances where the instrument was not available to collect data. For example, automatic zeros and spans are performed daily on most ambient gas analyzers; therefore, no ambient gas data can be collected during this time. As a result, the maximum percent valid for ambient gas data typically cannot be greater than 95.8. Percent valid can also be less than 100% due to influencing factors such as instrument error, operator error, timing problems, flow issues, and other factors that affect instrument operation.

Color shading key:
- Acceptable: indicates data recovery of 85% - 100%
- Marginal: indicates data recovery of 75% - 84.9%
- Low: indicates data recovery of 60% - 74.9%
- Unacceptable: indicates data recovery of 0% - 59.9%